Stoller
Hanford Office

HGLP-LDR-003

299-W18-155 (A7638)
Log Data Report

Borehole Information:

Borehole:	299-W18-155 (A7638)		Site:	Z-12 Crib	
Coordinates (WA St Plane)		GWL[1] (ft):	None	GWL Date:	11/28/05
North	East	Drill Date	Elevation (ft) (TOC)	Total Depth (ft)	Type
135486.541	566369.26	08/76	684.4	17	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Welded steel	0.25	10 3/4	10	3/8	0.25	17

Borehole Notes:

Casing diameter and stickup measurements were acquired using a caliper and steel tape. Logging data acquisition is referenced to the top of casing (TOC).

Spectral Gamma Logging System (SGLS) Equipment Information:

Logging System:	Gamma 1E		Type:	SGLS (70%) SN: 34-TP40587A
Effective Calibration Date:	03/04/05	**Calibration Reference:**	DOE/EM-GJ864-2005	
		Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 - Repeat	3	4	
Date	11/30/05	11/30/05			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	13.5	13.5			
Finish Depth (ft)	0.5	13.5			
Count Time (sec)	200	1000			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	1.0	1.0			
ft/min	N/A[2]	N/A			
Pre-Verification	AE137CAB	AE137CAB			
Start File	AE138000	AE138014			
Finish File	AE138013	AE138014			
Post-Verification	AE138CAA	AE138CAA			
Depth Return Error (in.)	0.0	0.0			
Comments	No fine-gain adjustment	No fine-gain adjustment. Repeat log.			

Logging Operation Notes:

Logging was conducted with a centralizer on the sonde. The driller's report indicates that the drillers "hit hot dirt at 17 ft, 2500 dpm, > 100 cpm". The sonde un-weighted at 13.7 ft. A 1000-second spectrum was therefore collected at the maximum log depth of 13.5 ft depth to better assay potential transuranic isotopes that may occur at the bottom of the borehole. Transuranics are common constituents in the waste streams of the 'Z' cribs. The 1000-second count also serves as the repeat measurement for this log.

Analysis Notes:

Analyst:	Pope	Date:	09/14/06	Reference:	GJO-HGLP 1.6.3, Rev. 0

Pre-run and post-run verifications for the logging system were performed before and after data acquisition. Acceptance criteria were met with the exception of the resolution of the 1461 keV (^{40}K) and 609 keV (^{214}Bi) energy peaks for the SGLS pre-survey verification spectrum, which were about 2% and 1% above the upper control limits, respectively. The resolution control limits are occasionally exceeded due to, among other things, differences in local environments in which verification spectra are acquired. Log spectra and the post-survey verification spectrum both exhibit good resolution. Examination of the pre-survey verification spectrum indicates the detector was functioning normally. Therefore, the pre-survey verification spectrum is accepted.

SGLS spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated using the EXCEL worksheet template identified as G1EMar05.xls. A casing correction for 0.375-in. thick casing was applied to the SGLS data.

Results and Interpretations:

^{137}Cs was detected at 0.5 ft in this borehole, at a concentration is approximately 1 pCi/g. The average MDL[3] for ^{137}Cs in this borehole is approximately 0.15 pCi/g. The spectrum at 0.5 ft was examined, and the peak at 662 keV is evident. ^{137}Cs was also detected at 7.5 ft, but inspection of the spectrum at that depth suggests it is a spurious detection. No other man-made radionuclides were detected in this borehole.

Westinghouse Hanford Company logged this borehole in 1993 with the Radionuclide Logging System (RLS). No manmade radionuclides were detected during that survey.

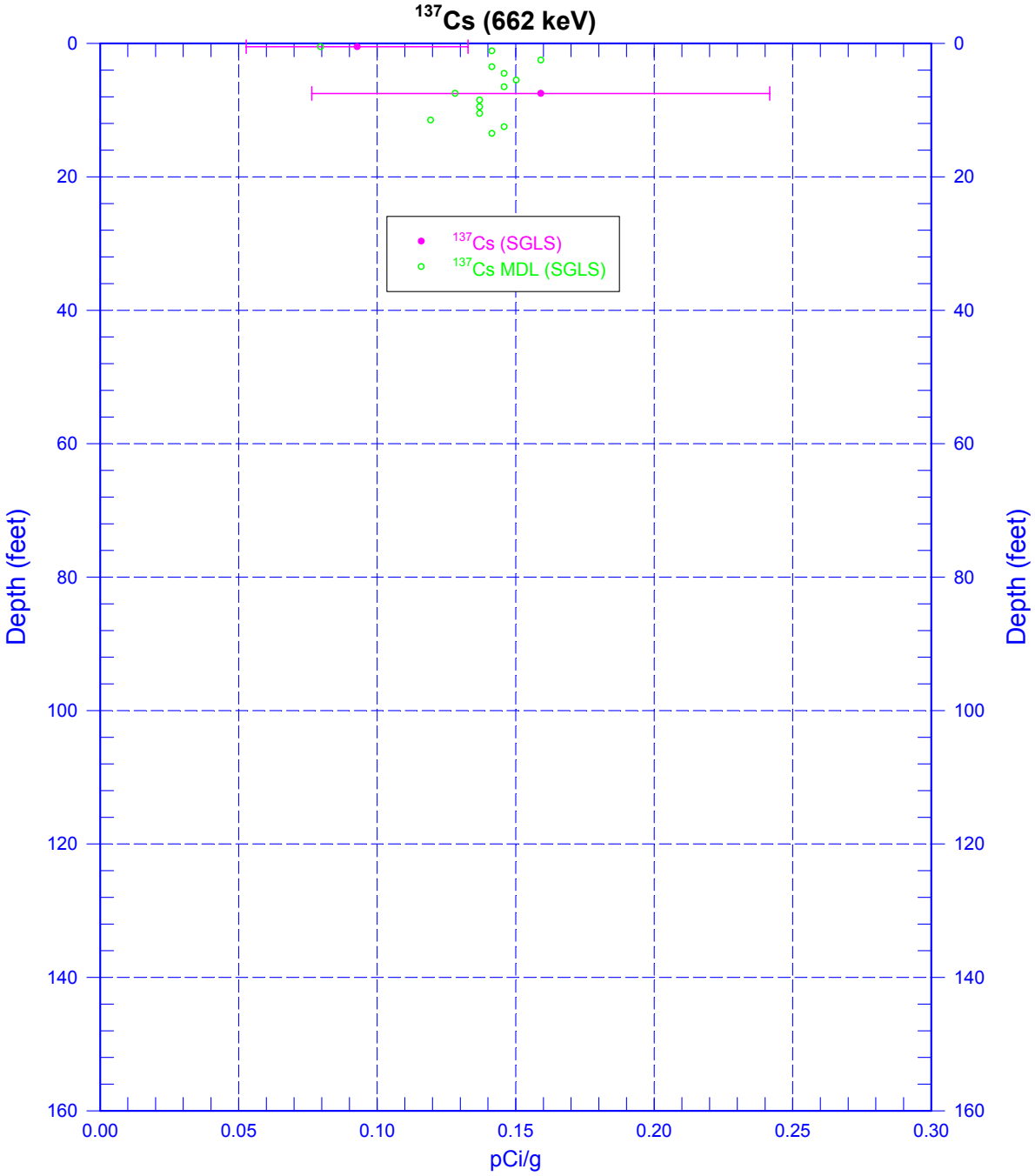
The repeat section for the SGLS indicates good agreement for the naturally occurring radionuclides. Even with the increased count time (1000 seconds), no manmade radionuclides were identified. Because transuranic waste is a known constituent of the waste streams in the Z-area cribs, a plot of the MDLs for ^{239}Pu, ^{241}Am, and ^{237}Np is presented.

List of Plots:

Man-Made Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma and Dead Time
Repeat Section of Natural Gamma Logs
MDLs for Selected Transuranic Radionuclides

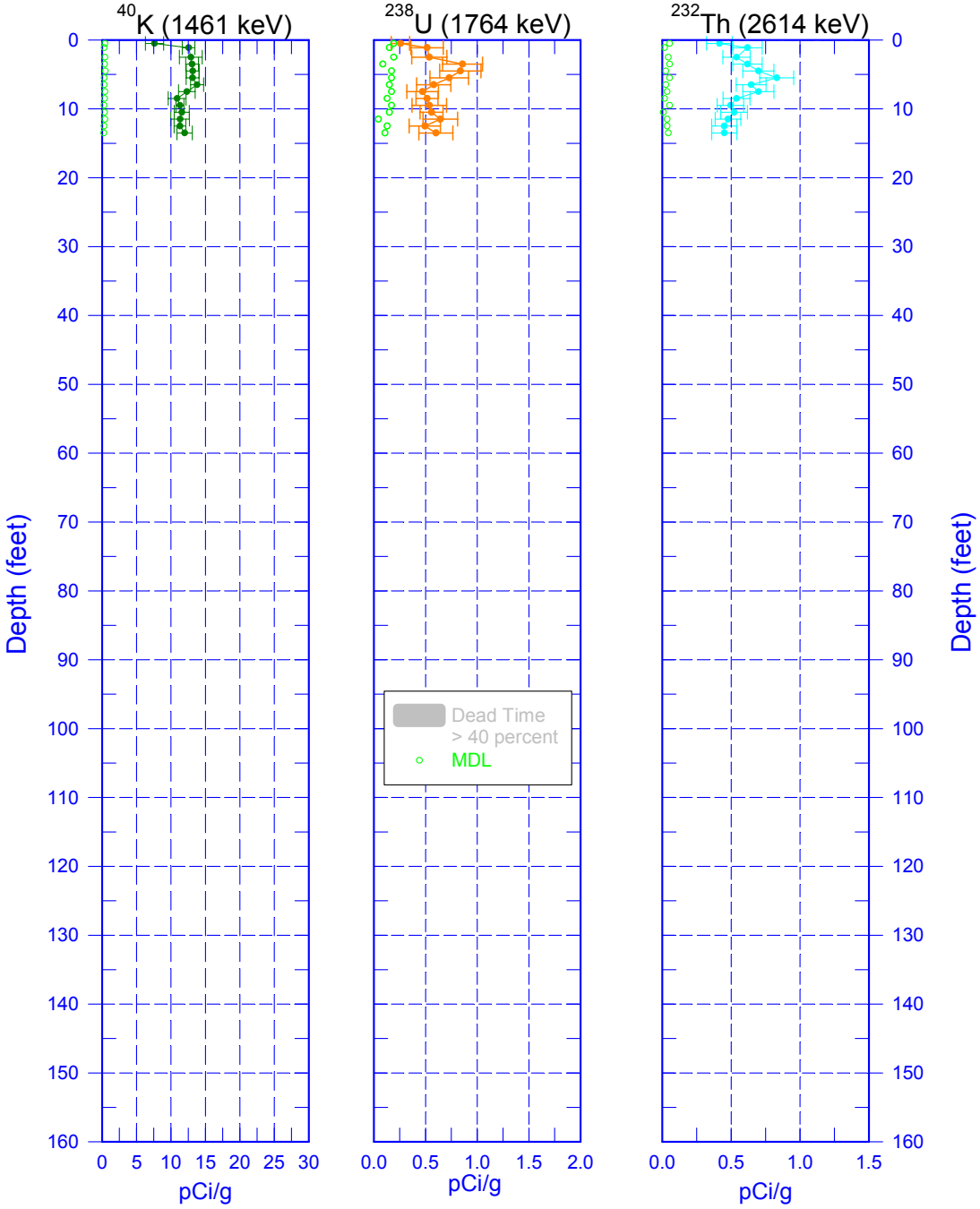
[1] GWL – groundwater level
[2] N/A – not applicable
[3] MDL – minimum detectable level

299-W18-155 (A7638)
Manmade Radionuclides



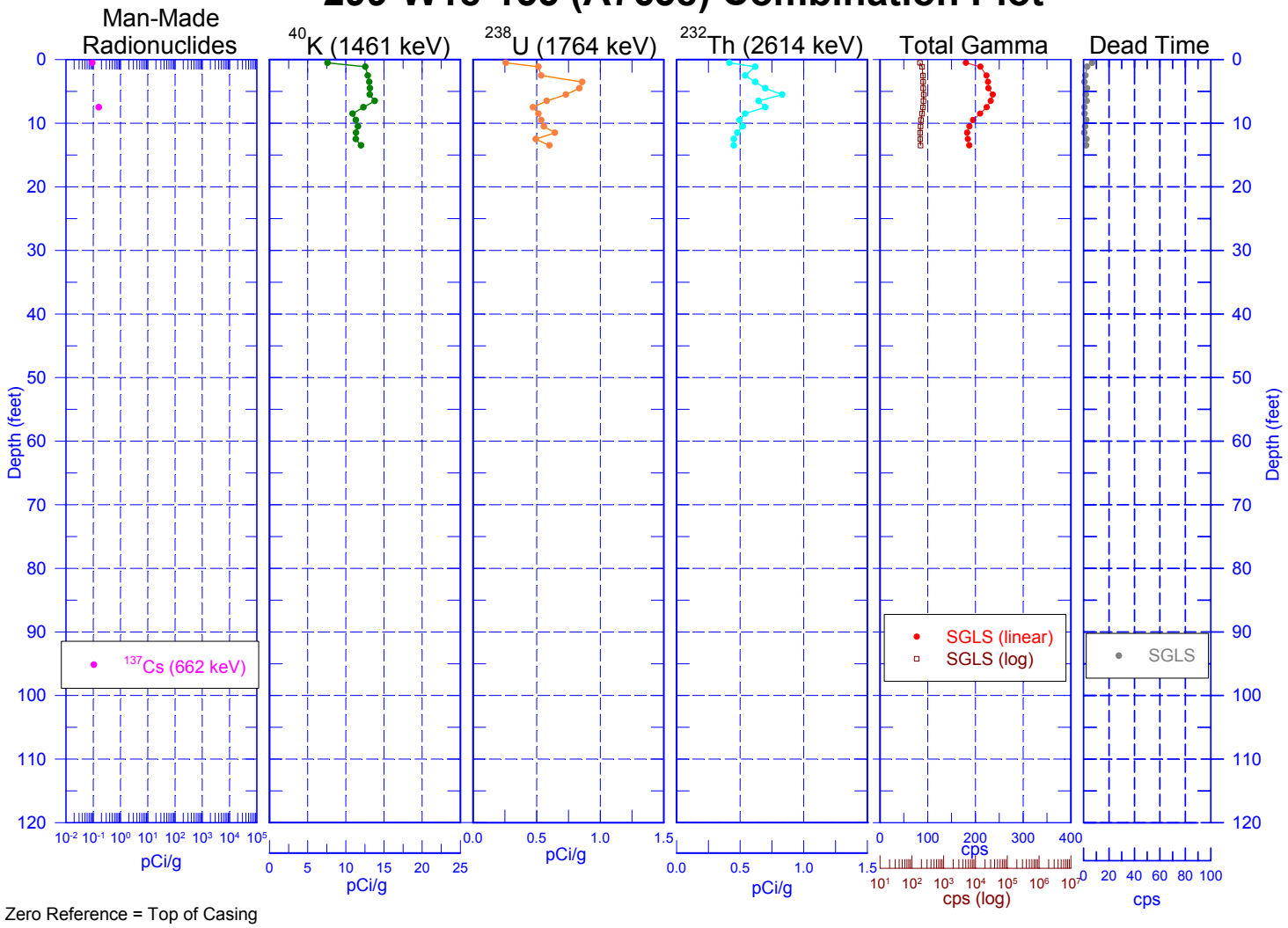
Zero Reference = Top of Casing

299-W18-155 (A7638)
Natural Gamma Logs

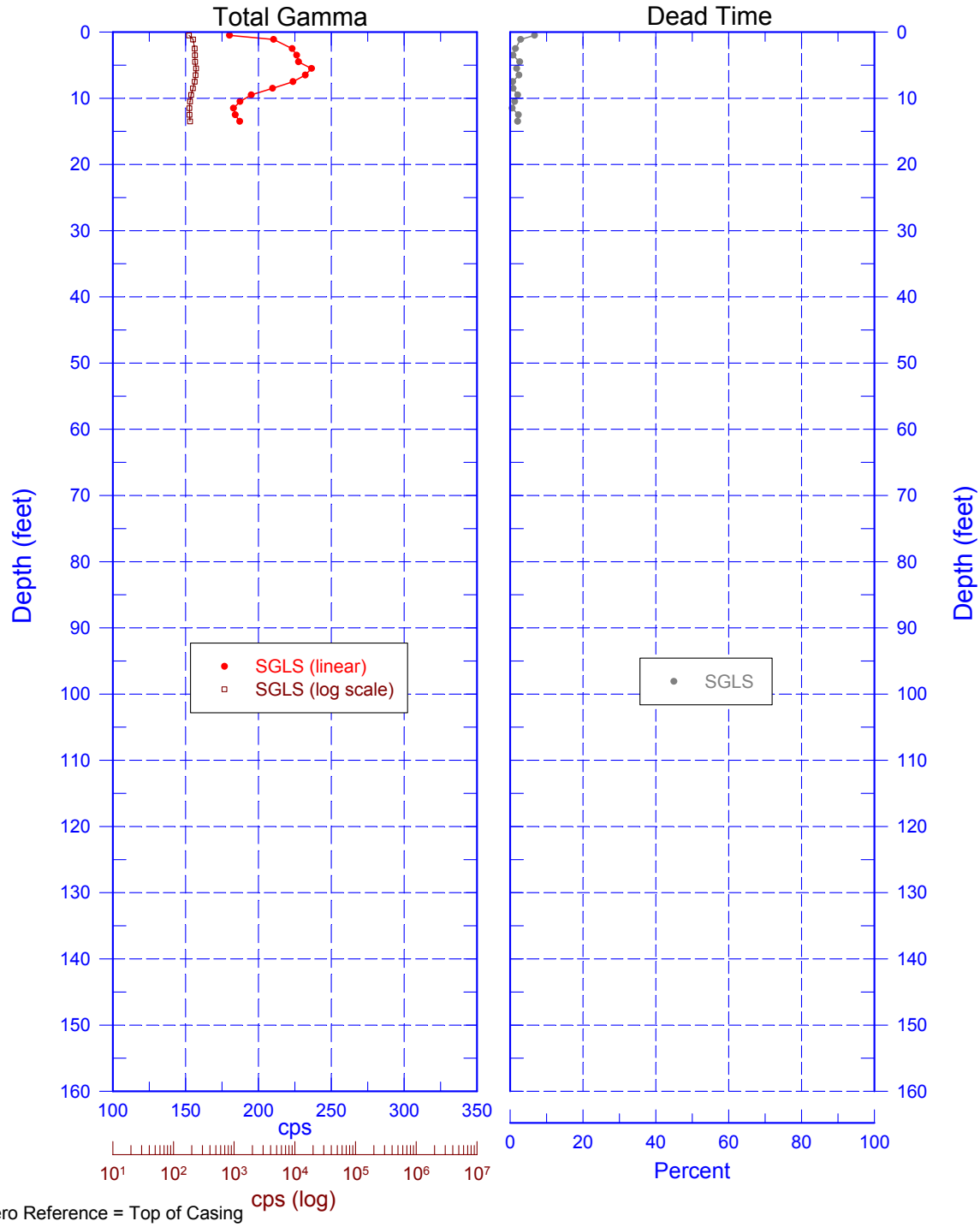


Zero Reference = Top of Casing

299-W18-155 (A7638) Combination Plot



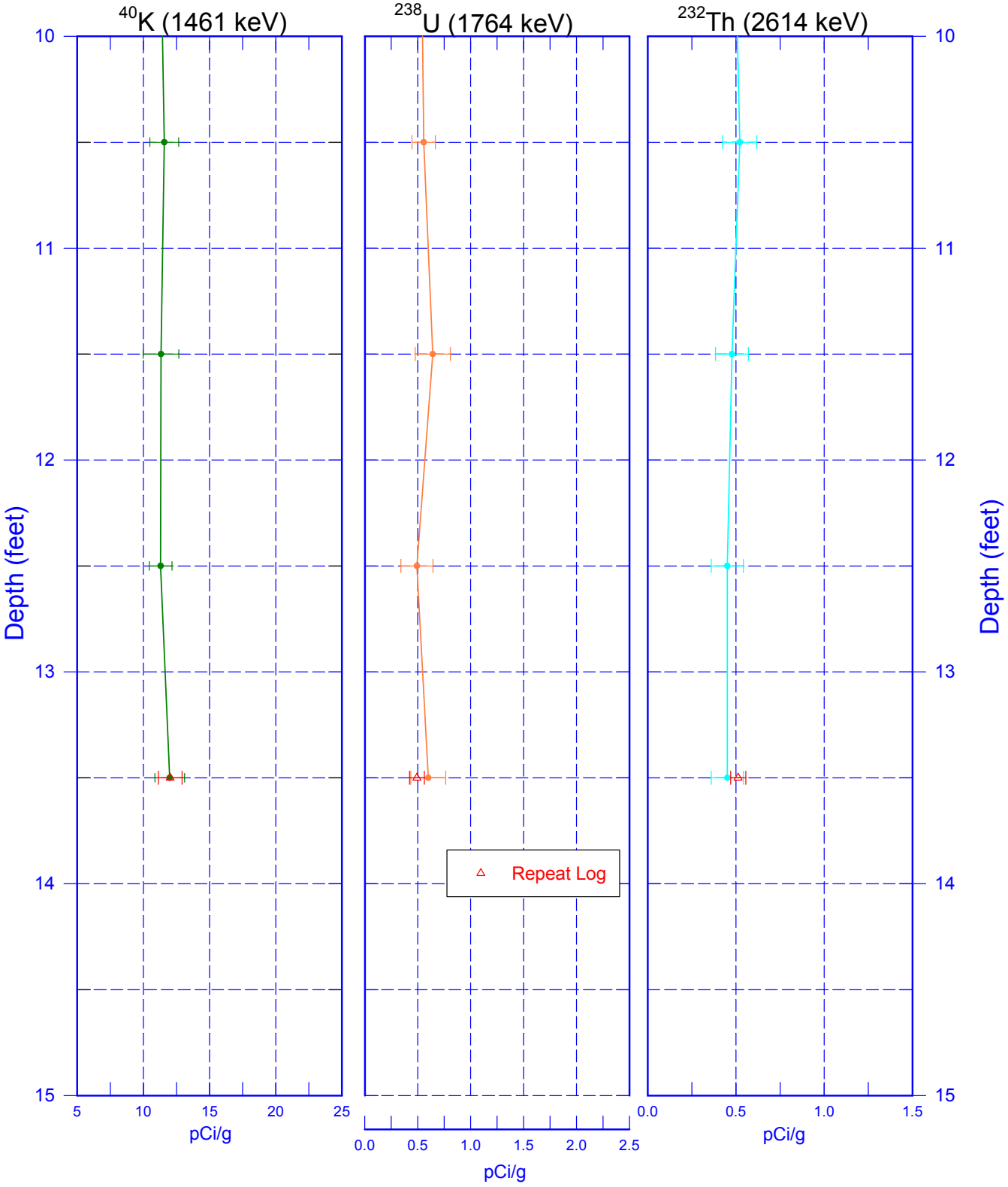
299-W18-155 (A7638)
Total Gamma & Dead Time



Zero Reference = Top of Casing

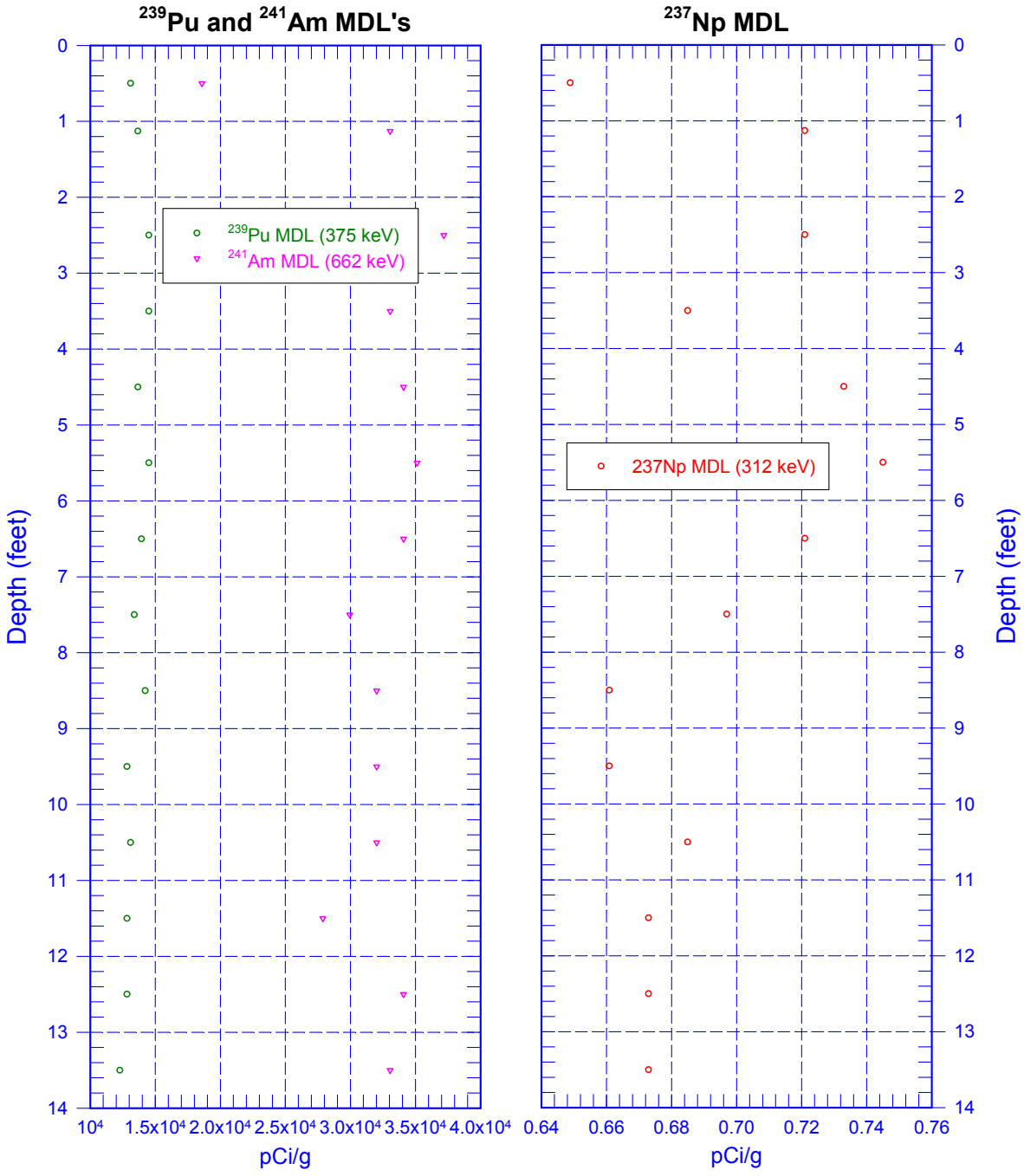
299-W18-155 (A7638)

Repeat Section of Natural Gamma Logs



Zero Reference = Top of Casing

299-W18-155 (A7638)
MDL's for Selected Transuranic Radionuclides



Zero Reference = Top of Casing